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ANOLIS WHITEMANI, NEW SPECIES FROM HISPANIOLA (SAURIA, IGUANIDAE)¹

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Miss Cochran in 1941 commented on the apparent extreme variability of *Anolis cybotes cybotes*, mentioning among other points that "some of the specimens have heavy keeling on the ventrals; in others from precisely the same locality, taken at the same time, the ventrals are perfectly smooth." Inspection of material referred to *cybotes* in the Museum of Comparative Zoology, the United States National Museum, and in the unreported collections of the American Museum of Natural History revealed that this phenomenon of sharp dimorphism in regard to keeling was curiously localized and that many of the localities were in the Cul de Sac Plain in Haiti and in its continuation in the Dominican Republic. A closer look at the specimens from this area showed further that there were indeed two kinds of *cybotes*-like anoles represented, and that they were in fact reported as taken at exactly the same localities by the same collector on the same dates. There seemed, however, to be not a difference in a single character but in several independent characters. The suspicion thus arose that species difference and not intraspecies dimorphism was involved. The suspicion was sharpened when P. S. Humphrey, collecting for Yale University and the University of Florida in 1959, brought back only two *cybotes*-like anoles from the Cul de Sac region, one of each type. The fresh material permitted also an increased confidence in a color difference which had seemed to exist in the specimens long in collections. When, therefore, in August 1959, E. E. Williams and A. S. Rand planned a visit to Haiti, one of the objectives was to obtain and examine alive a series of the keeled *cybotes*-like anole from the Cul de Sac.

¹ Notes on Hispaniolan herpetology no. 9.

This objective was achieved, and the keeled form in the Cul de Sac Plain proves indeed to be a new species, which we name in honor of M. Luc Whiteman of Port-au-Prince who has assisted in the recent Haitian explorations.

Since 1959, more material of *A. whitemani* has been obtained by A. S. Rand and J. D. Lazell, Jr. at Mole St. Nicolas on the northwest peninsula of Haiti—an arid area very similar to the arid portions of the Cul de Sac Plain in which *whitemani* was first found. In addition to these (MCZ) specimens and the material in the United States National Museum (USNM) and the American Museum of Natural History (AMNH), further specimens have been found in the collections of the Hamburg Museum. The latter, from Monte Cristi in the Dominican Republic, extend the range of *whitemani* considerably to the east but still along a dry coast.

ANOLIS WHITEMANI new species ¹

Type: An adult male, MCZ 60055, **road to Eaux Gaillees, Haiti**, E. Williams and A. S. Rand collectors, 13 August, 1959.

Paratypes: **Haiti**. MCZ 60056-9, same locality as the type, E. Williams and A. S. Rand coll. MCZ 62844, same locality as type, A. S. Rand and J. Lazell coll. YPM 3193, *Eaux Gaillees*, P. S. Humphrey and S. Van Vleck coll. AMNH 70588, *Eaux Gaillees*, A. Curtiss coll. USNM 117217-8, *Trou Caiman*, A. Curtiss coll. USNM 54189, *Thomazeau*, A. Curtiss coll. MCZ 62827-43, *Mole St. Nicolas*, A. S. Rand and J. Lazell coll. **Dominican Republic**. AMNH 50147, 50200, MCZ 61843, *Las Baitoas near Duverge*, W. G. Hassler coll. Hamburg Museum 5198 (3), *Monte Cristi*.

Diagnosis: Very close to *A. cybotes* but differing in squamation (dorsal scales larger, the middorsals hardly larger than adjacent scales, rather than abruptly larger; the ventrals smaller, hardly larger than middorsals, narrow and keeled, rather than wide, smooth and cycloid), and in color (body color very pale, nearly grey instead of distinctly brown, dewlap unmarked white, rather than grey with yellow streaks or yellowish or pinkish with grey streaks).

Description. *Head*: Head massive, snout to posterior border of eye about as long as tibia. Head scales mostly smooth. Five scales across head between second canthals. A shallow frontal

¹ Named for M. Luc Whiteman, who has helped so much in amassing the recent collections from Haiti.

depression. Naris in front of canthal ridge. Anterior nasal scale in contact with rostral.

Supraorbital semicircles narrowly in contact, partly in contact with supraocular disks. Supraocular disks consisting of about 8 enlarged keeled scales separated by 4-5 rows of granules from the scales of the supraciliary rows. One to two elongate supraciliaries continued backward by a double row of moderately enlarged scales. Canthus distinct, canthal scales 4, the second largest, decreasing gradually forward. Loreal rows 6-7, the lower row the largest. Supratemporal scales somewhat enlarged, flat, grading into the enlarged scales surrounding the interparietal. Interparietal larger than ear, separated from supraorbital semicircles by 1-2 scales.

Suboculars separated from supralabials by one row of scales, anteriorly separated from the canthal ridge by one scale, posteriorly continued behind eye for a short distance. Six supralabials to center of eye.

Mentals somewhat broader than long, in contact posteriorly with 4 throat scales. Infralabials narrow, in contact with 3 large, wide, nearly lunate sublabials. Throat scales small, swollen, not keeled, only the anterior ones elongate.

Trunk: Middorsal scales keeled, hexagonal, not much larger than adjacent scales which grade very gradually into granules on flanks. Ventrals not much larger than middorsals, relatively narrow, distinctly keeled, the keels in lines. Postanal scales small, poorly differentiated.

Gular fan: Moderate, scales cycloid, keeled, larger than ventrals.

Limbs and digits: Head and foot scales multicarinate. About 17 lamellae under phalanges 2 and 3 of fourth toe. Largest scales of limbs unicarinate, those of arm as large as, of thigh larger than ventrals.

Tail: Compressed. Each verticil surmounted by 4 keeled scales, ventrally 3 pairs of somewhat larger keeled scales per verticil.

Color in life: Four topotypes taken on road to Eaux Gailles: 1. Type ♂. Dewlap *white*. Ground color grey with indistinct transverse bands. Scattered brown spots on flanks and on sides of belly. 2. ♂. Dewlap pure white. Dorsum grey and cream. Pattern very obscure. Venter pure white. 3. ♀. Dorsum pale grey. Belly pure white. 4. ♂. Juvenile. Dewlap pure white. Dorsum cream and grey.

Notes by W. G. Hassler 1935 (Las Baitoas paratypes): "*Anolis*?-like *cybotes*: in grass on mountain side *above* road and forest. These anoles very grey or grey-brown. Pattern faint. Sides slightly yellowish grey. Belly and throat *white*. ♂ similar to ♀. Faint yellowish brown-grey longitudinal bars like ordinary *cybotes* but much lighter, less red and all very faint. Throat (very faint vermiculations), belly and fan *WHITE*."

SPECIES STATUS AND CHARACTER DIFFERENCES

The squamation and color differences between *whitemani* and *cybotes* in the Cul de Sac Plain are striking but hardly more striking than those between *cybotes* and "*Audantia*" *armouri* Cochran from the Massif de La Selle. New evidence, however, shows that the latter taxon, formerly considered a distinct genus, intergrades with *cybotes* at intermediate elevations in the foothills of the La Selle range, e.g. at Furey, 10 miles S. of Port-au-Prince. Some of the squamation differences between *whitemani* and *cybotes* are in fact rather similar to those between *armouri* and *cybotes* — although they are greater (Table 1, and Figs. 2-4). Thus the character differences are not *in themselves* great enough to establish species status for *whitemani*.



X *Anolis whitemani* n. sp. in
central and western Hispaniola

FIG. 1. Localities for *Anolis whitemani* n. sp.

TABLE 1.

Differences separating *cybotes*-like anoles in the Port-au-Prince area.

	<i>whitemani</i>	<i>cybotes</i> (Port-au-Prince and vicinity)	<i>armouri</i>
VENTRALS	keeled, narrow.	smooth, cycloid, wide.	smooth, cycloid, very wide.
TEMPORALS	granular, but larger than flank scales.	finely granular, even smaller than flank scales.	granular, but larger than flank scales.
MIDDORSALS	enlarged but grading into flank scales.	abruptly larger than flank scales.	enlarged but grading into flank scales.
BODY COLOR	pale tan.	brown to reddish.	olive.
BODY PATTERN	patternless or with pale grey transverse mark- ings.	patternless as adults or with greenish lines on flanks.	often with bold rhombs on flanks = persistence in adults of a juvenile pattern.
DEWLAP COLOR	white	pale yellow or rarely pale pink with white or greyish streaks or greyish with yel- lowish streaks.	pinkish or yel- lowish with green- ish smudges centrally. ¹

SPECIES STATUS AND DISTRIBUTION

In the final analysis the judgment that *whitemani* is a full species rather than a morph of *cybotes*, as Cochran (1941) believed, has been based on observation of the habits and habitats of the two species in the Cul de Sac region.

The topotypic series of *A. whitemani* was taken in open dry scrub along the road to Eaux Gaillées in the full sun of late morning. The same day quite typical *A. cybotes* were obtained in the grove of trees at the spring in the village of Eaux Gaillées and in a similar grove of trees at Manneville further east on the same road, again at a spring.

¹ Color notes from information provided by Dr. Albert Schwartz.

In the Cul de Sac Plain such groves of quite large trees around springs are quite literally oases in a thorn scrub desert. The fauna, like the flora of these oases, is characteristically that of rather moist areas.

The faunas of these oases are obviously disjunct, in effect island populations derived from the faunas of the moist forests of the mountain foothills to the south and to the north. The contrasts between the fauna within an oasis and that outside it are sharp and very characteristic. Within each oasis are animals that could be seen also in a pension garden in Port-au-Prince itself, e.g. *Anolis chlorocyanus*, *A. cybotes*, *A. distichus*, *Celestus costatus*. Outside, in the dry scrub, are *Anolis whitemani*, *Celestus curtissi*, *Leiocephalus semilineatus*.

A. cybotes and *A. whitemani* thus live in the same area but are sharply segregated by ecological preference and sharply distinguished by color and morphology. It is very important that the morphological differences are greater between *cybotes* and adjacent *whitemani* than between *cybotes* and more distant *armouri*; this is a demonstration that these two populations are behaving as good species.

The discovery of *A. whitemani* on the dry northwest coast at Mole St. Nicolas is a very valuable addition to the data on its distribution. When its occurrence seemed limited to the Cul de Sac Plain, *whitemani* was something of an anomaly, since this area has only relatively recently emerged from under the sea. However, with the realization that it is probably to be found all along the dry northwest coast of Haiti and is known as far east as the similar dry coast at Monte Cristi on the north coast of the Dominican Republic, its recent extension into similar arid habitats in the Cul de Sac Plain becomes very plausible. It is probably an autochthon of the dry west and northwest coast of the "northern island"—the portion of Hispaniola north of the former seaway through the Cul de Sac. (For a discussion of the importance of the northern and southern islands in Hispaniola zoogeography, see Williams, 1961.)

It is noteworthy that Humphrey obtained large series of the species *cybotes* on Gonave Id. (an island mostly dry but again with oases around the springs) but no *whitemani*. The latter may thus really be absent there. This requires further confirmation, but the fauna of Gonave has been derived by a limited and erratic sampling of the faunas of the neighboring mainland. The absence of any individual species is therefore not in itself surprising and need not imply oversight in collecting.

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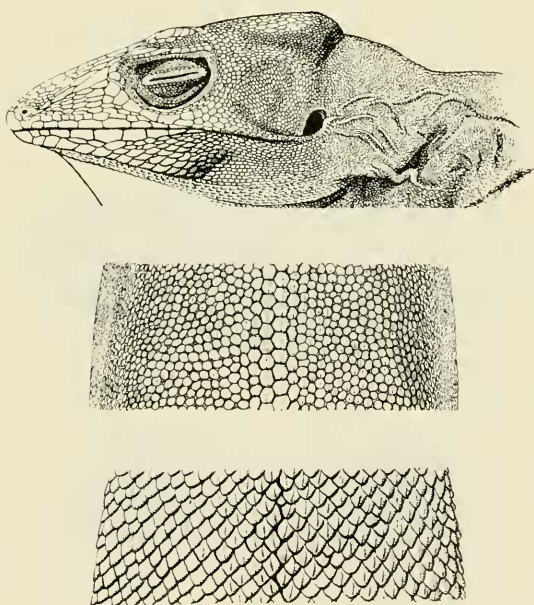


FIG. 2. *Anolis whitemani* n. sp. Paratype. MCZ 60056. *Top*: Side view of head. *Middle*: Dorsum at midbody. *Bottom*: Venter.

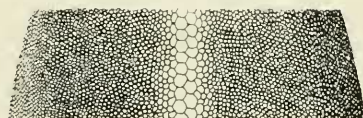
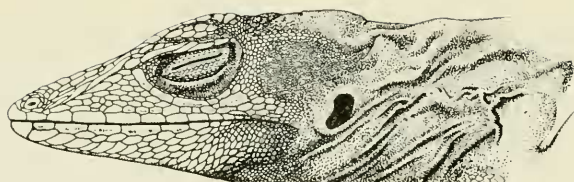


FIG. 3. *Anolis cybotes cybotes*. MCZ 59883. *Top*: Side view of head. *Middle*: Dorsum at midbody. *Bottom*: Venter.

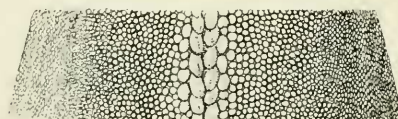
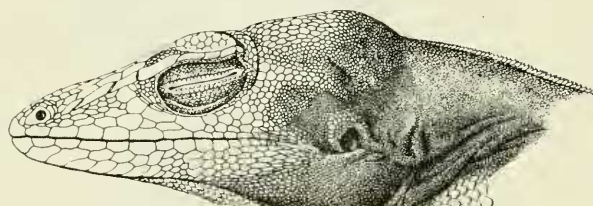


FIG. 4. *Anolis cybotes armouri*. MCZ 61051. *Top*: Side view of head. *Middle*: Dorsum at midbody. *Bottom*: Venter.